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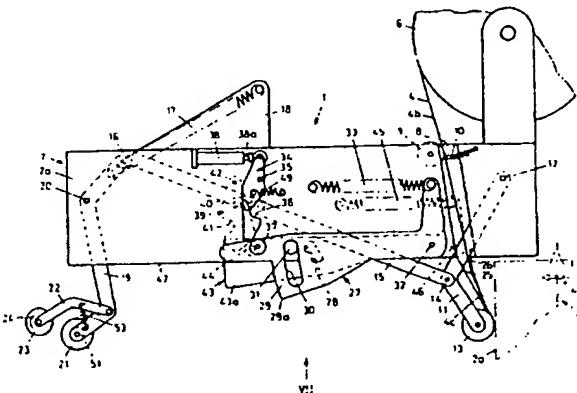
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## **54 Device for the Application of a Tape-shaped Handle to a Package**

<sup>54</sup> The device has two contact pressure rollers (13, 21) by means of which a piece of tape (4a) cut from a roll of tape (6) can be bonded adhesively to a package (2). After pasting the one end (4c) of the tape (4) to the package (2), the piece of tape (4a) is cut from the roll of tape (6) by means of the knife 28 and then advanced a predetermined distance via a freewheel (23) bearing-mounted on a lever (22). The back end of the piece of tape (4a) is finally pressed against the package by means of the second contact pressure roller (2) and stuck [to the package]. When applying the piece of tape (4a), the package (2) may run through without stopping.



## Description

The invention concerns a device for the application of a tape-shaped handle to a package, with a housing, at least one roll of tape, with contact pressure rollers by means of which the ends of a piece of tape cut from the supply roll can be pressed laterally against a package, and with means of cutting by means of which the piece of tape may be cut off the roll of tape.

With a known device of this kind, a piece of tape is laid over the upper side of a package and at its ends, this piece of tape is pressed against lateral surfaces of the package. In order that the piece of tape pressed and stuck [to the package] forms a handle for carrying the package and thus is able to be grabbed with one hand, between its bonded ends it must not lie tightly against the upper side of the package, but must lie loosely there and one must be able to grab underneath it. To do this with the known device, an isolated package is moved to the device, for example, on a conveyor belt, and stopped there. On top of the package [that] stands still, a gripper pulls over it a piece of tape supplied from a roll of tape, [pulling] in the direction transverse to the moving direction of the package, and cuts it off. At its ends, the piece of tape is stuck by means of two rollers to lateral surfaces of the package. A finger which simultaneously reaches under the piece of tape, slightly lifts it between its ends off the upper side of the package in order to ensure the mentioned loose arrangement. The package provided with the piece of tape is now moved away from the device so that a further package may be conveyed to it.

The packages to be supplied with handles usually consist of a plurality of four-beverage cartons held together, for example, by shrink wrap foil. In order to be able to keep the costs for applying the pieces of tape as low as possible, the throughput time of a package [being] in the device should be kept as short as possible. Damages to the package and also other malfunctions should further be avoided as much as possible.

The object of the invention is to create a device of the kind mentioned, which fulfills more extensively the demands mentioned and which nevertheless can be produced more cost-effectively.

The means for attaining this object with the generic device are in that means are provided which, after pressing one end of the tape against the package and after the cutting of the piece of tape, advance this piece of tape with respect to the package, by a

predetermined distance in the direction of the attached end. The device according to the invention has the essential advantage that the tape and the cut piece of tape can be placed over the package in the direction of its movement. Consequently, the packages must no longer be stopped for the application of the handle or the piece of tape and can run through continuously. Elaborate grippers and the finger mentioned are not necessary, such that altogether, the device according to the invention can be achieved [to be] much simpler in construction. The device can be produced [to be] so compact that in the case of a malfunction of the packaging device it can very easily be replaced entirely.

According to a further development of the invention, the means mentioned have a roller which is bearing-mounted to a swiveling lever and which in order to advance the piece of tape is shiftable in the moving direction of the package. The means mentioned can thus be achieved constructively in a very easy and secure way. According to a further development of the invention, this roller is bearing-mounted to a lever so as to swivel, which [lever] has a second contact pressure roller arranged on it. Through this it is possible to perform the shifting of the piece of tape and the pressing of the rear end of the piece of tape against [the package] by means of very simple means and very reliably.

The roller [used] for shifting the piece of tape is preferably a freewheel roller which is locked into one direction of rotation when shifting the piece of tape.

A particularly simple sequence of motions results if the means for cutting are located between a first contact pressure roller and a second contact pressure roller. The front end of the tape is stuck to the package by means of the first contact pressure roller and, after cutting off the piece of tape, the rear end of the piece of tape [is stuck] by means of the second contact pressure roller. The means for shifting the piece of tape are preferably arranged such that they become active after the cutting of the piece of tape and prior to the application through pressure of the rear end of the piece of tape.

The means for cutting the tape have, for example, a knife which may be controlled pneumatically or by means, for example, of a photocell.

Further advantages of the invention result out of the dependent claims, the following description as well as the drawing. In the following, one example of embodiment of the invention is explained more closely by means of the drawing. [The figures] show:

Fig. 1 an end view of the device according to the invention in a starting position and a partial view of a package which is to have a handle applied to it,

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Fig. 2 a view according to Fig. 1, but where some parts are left out for representation reasons and the free end of a tape is pressed against and stuck to the advanced package,

Fig. 3 a view of the device according to the invention with a package advanced further and directly prior to the cutting of the tape,

Fig. 4 a view of the device according to the invention immediately after the cutting of a piece of tape,

Fig. 5 a view of the device according to the invention after the advancement of the cut piece of tape,

Fig. 6 a view of the device according to the invention when applying by pressure to the rear end of the piece of tape,

Fig. 7 a view of the device according to the invention, seen in the direction of the arrow VII of Fig. 1, and

Fig. 8 a view of a package with an attached handle.

Fig. 1 shows the device 1 according to the invention in a side view, which has a frame 7 on which is bearing-mounted a roll of tape 6 with an adhesive tape 4 attached at equal spacing on one side. According to Fig. 7, the frame 7 consists of two parallel base plates 7a and 7b, whereby the plate 7a has a transversally running slit 8 for inserting the tape 4 into the frame 7. In Fig. 1, the device is shown in the starting position. The tape 4 extends through between the two base plates 7a and 7b and extends with one end 4c beyond one lower edge 47. The end 4c is positioned via two brackets 25 and 26 attached elastically to the lever 11. As is recognizable, the end 4c of the tape 4 is in front of a contact pressure roller 13 which is bearing-mounted to a lever 11. This [lever] is angle-shaped, whereby the roller 13 is bearing-mounted at one end, and at the opposite end, the lever 11 is mounted swiveling to the frame 7 via a hinge 12. A connecting rod 15 connects the lever 11 to a further lever 19 which at a distance to the hinge 12 is also mounted swiveling to the frame 7 via a hinge 20. At a lower end projecting beyond the edge 47, this additional lever 19 carries a second contact pressure roller 21 and at an upper end is connected to the connecting rod 15 via a hinge 16. At the other end, the connecting rod 15 is connected via a hinge 14 to the lever 11. A tension spring 17 is attached at one end to a frame part 18 and at the other end to the lever 19 between the hinges 16 and 20. If a package 2 to which a piece of tape 4 is to be attached as handle is now moved in the direction of the arrow 48 against the first contact pressure roller 13,

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then this [roller] can evade in the direction of the arrow 48, against the elastic force of the tension spring 17. The elastic force of the tension spring 17 causes the first contact pressure roller to be pressed against the front end 2a of the package. Since the tape end 4c is now in front of the first contact pressure roller 13, this end 4c which is provided on the inside with an adhesive layer is stuck to the package 2 at the front end 2a. The contact pressure roller 13 hereby moves in the direction of the arrow 48 and at the same time upwards along the front side 2a until it has reached the position shown in Fig. 2, in which it lies against the upper edge 2b of the package 2. During this first swiveling movement of the lever 11, the lever 19 is moved via the connecting rod 15 into the position shown in Fig. 2, in which as recognizable, the second contact pressure roller 21 is above the edge 47, between the two plates 7a and 7b. The tape end 4c is now stuck to the front side 2a of the package 2.

After the pasting of the tape end 4c to the package 2, the tape 4 is cut by means of a knife 28 at a predetermined distance from the tape end 4c. For this, the knife 28 is fastened to a knife lever 27 which via a hinge 32 fastened to the frame is bearing-mounted to the frame 7 to be swiveling to a limit extent. A tension spring 33 is attached with the one end to the frame 7 and with the other end via the hinge 32 to the knife lever 27. Through this tension spring 33, the knife lever 27 is held in the swivel position shown in Fig. 2, the position of which is determined by a pin 31 extending into a longitudinal slit 30. Attached to the knife lever 27 there is a nose 29 which projects downwards over the edge 47. If the package 2 is now moved beyond the position shown in Fig. 2, further on in the direction of the arrow 48, along the edge 47, then the package 2 runs against the nose 29 and thereby swivels the knife lever 27 clockwise around the hinge 32 while the tension of the tension spring 33 increases. Prior yet to the rear edge 2c of the package 2 having reached the end of the nose 29, a first holding catch 34 with a recess 36 catches a roller 37 of the knife lever 27. This catch 34 can be swiveled around a hinge 35 and is pressed against the roller 37 by means of a tension spring 49 acting underneath this hinge 35. The knife 28 is thus held mechanically doubly secured in the retracted position shown in Fig. 3 on one hand through the catch 34 and on the other hand through the nose 29 lying against the upper side of the package 2. By this [it] is ensured that the knife can not inadvertently damage the package 2, which would lead to a disturbance.

If the package 2 is moved further in the direction of the arrow 48 beyond the position shown in Fig. 3, then the edge 2c of the package 2 finally passes over a lower edge 29a of the nose 29 and accordingly releases it. This catch 34 is swiveled electrically controlled clockwise about the hinge 35 by means of a pneumatic cylinder, the piston rod 38a of which acts upon the catch 34 above the hinge 35, through which the engagement of the catch 34 to the roller is released. The unsecured knife lever 27 is swiveled abruptly by the tension-loaded tension spring 33 counterclockwise around the hinge 32. Through that, the accordingly downwards moving knife 28 severs the tape 4 and cuts a piece of tape 4a off of it. This cutting away of the piece of tape 4a is shown schematically in Fig. 4. At its rear, free end 4b, the cut piece of tape 4a is also provided with an adhesive layer on the underside.

As shown by Fig. 3, during the mentioned swiveling motion of the knife lever 27, the lever 19 and by that the second contact pressure roller 21 is localized in its retracted position through a second catch 39. This second catch 39 is fastened swiveling to the frame 7 via a hinge 42 and has a recess 41 in which engages a roller 51 of the lever 19. The catch 39 is held in the position shown in Fig. 3 through a roller 44 which acts upon the catch 39 opposite the recess 41, below the hinge 42, and holds it in the position mentioned against the reacting tension of a spring 40. The roller 44 is mounted to a lever 43 which is connected swiveling to the frame 7 via a hinge 46. The lever 43 also has a nose 43a projecting downwards past the edge 47, upon which the package 2 runs during the movement mentioned and by that moves upwards the roller 44 against the reacting force of a tension spring 33 so as to engage the catch 39 against the lever 19. Seen in the direction of the arrow 48, the nose 43a is in front of the nose 29a. The lever 43 is accordingly released behind the lever 27, after passing over the nose 43a. If thus the rear edge 2c of the package 2 surpasses the nose 43a, then roller 44 is moved downwards by the spring-loaded tension spring 45 and the second catch 39 is swiveled by the tension spring 40 counterclockwise around the hinge 42, through which the roller 51 and by that the lever 19 is released. Through the tension of the spring 17, the lever 19 is now swiveled clockwise around the hinge 20. Through that, the second contact pressure roller 21 is moved against the upper side of the package 2. At the same time, a roller 23 which is bearing-mounted to a lever 22 and connected swiveling to the lever 19 is pressed down against the upper side of the package 2. The roller 23 is a freewheel roller which

can be rotated in the direction of the arrow 24 (Fig. 1), against the reacting force of a tension spring 53. During the movement of the roller 21, the roller 23 evades in the direction of the arrow 52 (Fig. 5) in the direction of movement of the package and in particular considerably faster than the moving speed of the package 2. A tension spring 53 acting upon the lever 22 and the lever 19 hereby pulls the roller 23 against the piece of tape 4a and the package 2. Through this motion of the roller 23, the piece of tape 4a is now pushed forwards by a predetermined length and by that, the rear end 4b of the piece of tape 4a is moved closer towards the package 2. Through this shifting motion of the roller 23 one achieves that the piece of tape 4a is by a certain length longer between its ends 4b and 4c than the distance between the edges 2b and 2c of the package 2. This predetermined length can be modified in an easy way through a modification of the distance of the pivot point 20 from the edge 47. Fig. 5 shows clearly how in front of the roller 23, the tape 4a is lifted in an arc-shaped region 4d off the upper side of the package 2.

The second contact pressure roller 21 has now reached the rear edge 2c of the package 2 and runs over it at a further movement of the package and hereby presses the rear end 4b of the piece of tape 4a against the back side of the package 2. The pasting of the piece of tape 4a to the package 2 and with that the application of the handle is thereby completed. The package 2 can now leave the device 1. The device 1 is now ready for the application of a further piece of tape to a further package 2, because according to Fig. 6, the first tape roller 13 has reached again its starting position. The tape 4 reaches again with its end downwards over the edge 47 up to the first contact pressure roller 13 and, according to Fig. 1, is localized by a finger 10, which pushes the tape 4 against a roller 9, against a pull-back motion. The movement into this starting position is caused by a tension spring 17 which also brings the lever 19 with the rollers 21 and 23 back into the starting position shown in Fig. 1.

As explained above, a freewheel roller 23 is essentially provided in the embodiment shown here for advancing the piece of tape 4a. But this [roller] may also be replaced by other suitable means. A suction or blowing device may be feasible here, which after the pasting of the tape end 4c pushes the piece of tape 4a forwards on the package 2. The knife 28, too, may be replaced by another cutting device.

Despite the considerable advantages of the device according to the invention, it may obviously be achieved with simple and robust structural components. A device was thus created according to the invention which not only satisfies in an excellent way the packaging-technological requirements, including a very careful handling of the packages, but based on its simple and robust design is also economical in its production and operationally reliable.

## Patent Claims

1. Device for the application of a handle to a package (2), with a housing (7), at least one roll of tape (6), with contact pressure rollers (13, 21), by means of which the ends (4b, 4c) of a piece of tape 4a cut from a roll of tape (6) may be pressed laterally against the package (2) and with cutting means (28) by means of which the piece of tape (4a) may be cut off the roll of tape (6), characterized in that means (23, 22) are provided which, after pressing one end (4c) of the piece of tape (4a) against the package 2 and after the cutting of the piece of tape (4a), advance this piece of tape (4a) in relation to the package 2, for a predetermined length in the direction of the attached end (4c).
2. Device according to claim 1, characterized in that the means mentioned (23, 22) have a roller (23) which is bearing-mounted to a swiveling lever (22) and is movable in the moving direction (48) of the package 2 so as to shift the piece of tape (4a).
3. Device according to claim 1 or 2, characterized in that the means (23, 22) are bearing-mounted to a lever (19) on which is arranged a second contact pressure roller (21).
4. Device according to one of the claims 1 through 3, characterized in that the means mentioned (23, 22) may be brought into a spring-loaded position.
5. Device according to one of the claims 1 through 4, characterized in that the means mentioned (23, 22) may be brought by the first contact pressure roller (13) into a spring-loaded position.
6. Device according to one of the claims 3 through 5, characterized in that for the advancement of the piece of tape (4a), the roller (23) is a freewheel roller which may be pressed against the piece of tape (4) by means of a spring element (53).
7. Device according to one of the claims 1 through 6, characterized in that the package (2) is movable in the longitudinal direction of a lower edge (47) of the frame 97),

and that the tape (4) is movable over the package (2) along the longitudinal direction of this edge (47).

8. Device according to one of the claims 1 through 7, characterized in that the cutting means (28) are arranged between a first contact pressure roller (13) and the mentioned means (23, 22) and that the means for cutting (23) may be arrested in a retracted position.

9. Device according to claim 8, characterized in that the means for cutting (28) are located on a lever (27), which lever (27) has a downwards projecting nose (29a) which in a starting position of the lever (27) extends beyond a lower edge (47) of the frame (71<sup>1</sup>) such that a package (2) running along the edge (47) lifts the lever (27) by the nose (29a) into a retracted position.

10. Device according to claim 9, characterized in that the lever (27), to which are attached the means of cutting (28), may be arrested by a catch (34) in a retracted position.

11. Device according to one of the claims 1 through 10, characterized in that the second contact pressure roller (21) may be arrested by a catch (39) in a retracted position.

12. Device according to claim 11, characterized in that a swiveling lever (43) is bearing-mounted to the frame (7), which is swiveled away by a package (2) passing through and which by that arrests the second contact pressure roller (21) in a retracted position.

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<sup>1</sup> sic. (7) must have been intended